This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended). A demodulator comprising:

a system for receiving modulated signals defining received signals;

a storage device for storing initial decision boundaries for use in demodulating said modulated signals;

a system for determining the actual distance between said received signals;

a system for adjusting said initial boundaries as a function of said actual distance between said received signals, defining adjusted decision boundaries; and

a system for decoding said modulated signals relative to said adjusted decision boundaries.

2. (Previously Presented). The demodulator as recited in claim 1, wherein said system for adjusting includes a system for mapping said adjusted boundaries to a decision map.

3. (Previously Presented). A demodulator comprising:

a system for receiving modulated signals defining received signals;

a storage device for storing initial decision boundaries for use in demodulating said modulated signals;

a system for determining the actual distance between said received signals relative to said initial decision boundaries;

a system for adjusting said initial boundaries as a function of said actual distance defining adjusted decision boundaries;

a system for decoding said modulated signals relative to said adjusted decision boundaries; and

a system for transmitting and decoding a predetermined training sequence defining decoded reference signals and a symbol error counter for comparing said decoded reference signals to a predetermined training sequence to further improve the bit error rate.

4. (Currently Amended). A demodulator comprising:

a system for receiving modulated signals defining received signals;

a storage device for storing initial decision boundaries for use in demodulating said modulated signals;

a system for determining the actual distance between said received signals relative to said initial decision boundaries;

a system for adjusting said initial boundaries as a function of said distance between said received signals, defining adjusted decision boundaries;

a system for decoding said modulated signals relative to said adjusted decision boundaries; and

a system for measuring the bit error rate (BER), wherein said system for adjusting includes a system for dithering the location of said decision boundaries while said bit error rate (BER) is measured and selecting the location of the decision boundary where the BER is minimal.

5. (Currently Amended). A demodulator comprising:

a system for receiving modulated signals defining received signals;

a storage device for storing a reference constellation;

a system for determining the actual distance between said received signals;

a system for adjusting the location of said reference constellation as a function of said actual distance between said received signals defining an adjusted reference constellation and storing said adjusted reference constellation; and

a system for decoding said received signals relative to said adjusted reference constellation.

6. (Previously Presented). The demodulator as recited in claim 5, wherein said system for adjusting includes a system for mapping said adjusted reference constellation to a memory map.

7. (Cancelled).

8. (Currently Amended). A demodulator comprising:

a system for receiving modulated signals defining received signals;

a storage device for storing a reference constellation;

a system for determining the actual distance between said received signals and said reference constellation;

a system for adjusting the location of said reference constellation as a function of said actual distance between said received signals defining an adjusted reference constellation and storing said adjusted reference constellation; and

a system for decoding said received signals relative to said adjusted constellation, wherein said system for adjusting includes a system for dithering each point in said reference

constellation and selecting a location for said reference constellation in which the bit error rate is minimal.

9. (Previously Presented). The demodulator as recited in claim 8, wherein said system for dithering includes a system for dithering said points of said reference constellation in one or the other of a horizontal or vertical direction.

10. (Previously Presented). The demodulator as recited in claim 8, wherein said system for dithering includes a system for dithering said points in said reference constellation in both a horizontal and a vertical direction.

11. (Currently Amended). A method for demodulating a signal comprising the steps of:

(a) receiving modulated signals defining received signals;

(b) storing a predetermined decision boundary for demodulating said received signals;

(c) determining the actual distance between pairs of said received signals and comparing said predetermined decision boundaries with the midpoint of said distance;

(d) adjusting said predetermined boundaries so as to be at the midpoint of said actual distance between said received signals defining adjusted decision boundaries;

(e) storing said adjusted decision boundaries; and

(f) decoding said received signals relative to said adjusted decision boundaries.

12. (Original). A method for demodulating a signal as recited in claim 11, wherein said adjusting step includes the step of mapping said adjusted boundaries to a decision map.

13. (Previously Presented). A method for demodulating a signal comprising the steps of:

(a) receiving modulated signals defining received signals;

(b) storing a predetermined decision boundary for demodulating said received signals;

(c) determining the actual distance of said received signals relative to said predetermined decision boundaries;

(d) adjusting said predetermined boundaries as a function of said actual distance defining adjusted decision boundaries;

(e) storing said adjusted decision boundaries;

(f) decoding said received signals relative to said adjusted decision boundaries defining decoded signals; and

(g) providing a symbol error counter for comparing said decoded signals to a predetermined training sequence to further improve the bit error rate.

14. (Previously Presented): A method for demodulating a signal comprising the steps of:

(a) receiving modulated signals defining received signals;

(b) storing a predetermined decision boundary for demodulating said received signals;

(c) determining the actual distance of said received signals relative to said predetermined decision boundaries;

(d) adjusting said predetermined boundaries as a function of said actual distance defining adjusted decision boundaries;

(e) storing said adjusted decision boundaries;

(f) decoding said received signals relative to said adjusted decision boundaries; and

(g) measuring the bit error rate; wherein said adjusting step comprises: dithering the location of said decision boundaries while said bit error rate (BER) is measured and selecting the location of the decision boundary at which the BER is minimal.

15. (Previously Presented). A method for demodulating a signal comprising the steps of:

(a) receiving modulated signals defining received signals;

(b) storing a reference constellation;

(c) determining the actual distance between pairs of said received signals;

(d) adjusting the location of said reference constellation as a function of said actual distance defining an adjusted constellation;

(e) storing said adjusted reference constellation; and

(f) decoding said signals relative to said adjusted reference constellation.

16. (Original). A method for demodulating a signal as recited in claim 15, wherein said adjusting step includes the step of mapping said adjusted reference constellation to a memory map.

17. (Cancelled).

18. (Previously Presented). A method for demodulating a signal comprising the steps of:

(a) receiving modulated signals defining received signals;

(b) storing a reference constellation;

(c) determining the actual distance between said received signals and said reference constellation;

(d) adjusting the location of said reference constellation as a function of said actual distance defining an adjusted reference constellation;

(e) storing said adjusted reference constellation;

(f) decoding said signals relative to said adjusted reference constellation;

(g) measuring the bit error rate (BER); and

(h) dithering each point in said reference constellation while said bit error rate (BER) is measured and selecting a location for said reference constellation in which the bit error rate is minimal.

19. (Previously Presented). A method for demodulating a signal as recited in claim 18, wherein said dithering step comprises dithering said points of said reference constellation in one or the other of a horizontal or vertical direction.

20. (Previously Presented). A method for demodulating a signal as recited in claim 18, wherein said dithering step comprises dithering said points in said reference constellation in both said horizontal and said vertical direction.